REMARKS

Claims 8, 11, 14 and 17 to 20 have been amended to overcome the rejection under 35 U.S.C. 112, second paragraph and to better define the invention. Claims 8 to 20 remain active in this application and claims 1 to 7 stand withdrawn from consideration..

Claims 8 to 20 were rejected under 35 U.S.C. 102(b) as being anticipated by Morozov et al. The rejection is respectfully traversed.

Claim 8 requires, among other features, a flow cell attached to the surface plasmon resonance layer, having a fluid path, an analyte detection chamber disposed along the fluid path and having an interior surface in fluidic communication with the surface plasmon resonance layer and having means for generation of a molecular interaction bias across the chamber. No such combination of elements is taught or suggested by Morozov et al. either alone or in the total combination as claimed.

Claims 9 and 10 depend from claim 8 and therefore define patentably over Morozov et al. for at least the reasons presented above with reference to claim 8.

In addition, claim 9 further limits claim 8 by requiring that the molecular interaction bias be electrical. No such combination is taught or suggested by Morozov et al.

Claim 10 further limits claim 8 by requiring that the molecular interaction bias be magnetic. No such combination is taught or suggested by Morozov et al.

Claim 11 requires, among other features, an analyte detection chamber in fluidic communication with the surface plasmon resonance layer having means for generating a molecular interaction bias across the analyte detection chamber to direct bias responsive conjugated molecules to the surface plasmon resonance layer. No such combination of

elements is taught or suggested by Morozov et al. either alone or in the total combination as claimed.

Claims 12 and 13 depend from claim 11 and therefore define patentably over Morozov et al. for at least the reasons presented above with reference to claim 11.

In addition, claim 12 further limits claim 11 by requiring that the molecular interaction bias be electrical. No such combination is taught or suggested by Morozov et al.

Claim 13 further limits claim 11 by requiring that the molecular interaction bias be magnetic. No such combination is taught or suggested by Morozov et al.

Claim 14 requires, among other steps, the step of providing means in the chamber for generating a molecular interaction bias across the chamber. No such step is taught or suggested by Morozov et al. either alone or in the total combination as claimed.

Claim 14 further requires the steps of providing a conjugate between an analyte and a bias responsive moiety, wherein the analyte is reactive with the derivatized surface plasmon layer and the bias responsive moiety changes the response of the analyte to the molecular interaction bias, introducing the conjugated analyte into the chamber and generating the molecular interaction bias within the chamber. No such combination of steps is taught or suggested by Morozov et al. either alone or in the total combination as claimed.

Claims 15 and 16 depend from claim 14 and therefore define patentably over Morozov et al. for at least the reasons presented above with reference to claim 14.

In addition, claim 15 further limits claim 14 by requiring that the molecular interaction bias be electrical. No such combination is taught or suggested by Morozov et al.

Claim 16 further limits claim 15 by requiring that the molecular interaction bias be magnetic. No such combination is taught or suggested by Morozov et al.

Claims 17 and 18 define the apparatus for performing the methods of claims 15 and 16 respectively and therefore define patentably over Morozov et al. for at least the reasons presented above with reference to claim 15 and 16.

Claim 19 depends from claim 14 and therefore defines patentably over Morozov et al. for at least the reasons presented above with reference to claim 14.

In addition, claim 19 further limits claim 14 by requiring that the conjugated analyte be for the kinetically enhanced measurement of molecular interactions in the groups consisting of: avidin-biotin binding, antibody-antigen binding, antibody-antigen dissociation kinetics, protein binding, protein-nucleic acid binding, specific detection of small molecules, concentration of analytes, measurement of oligonucleotide complements, mixture proportions, receptor-ligand interactions, aptamer interactions, and molecular assembly events. No such combination is taught or suggested by Morozov et al.

Claim 20 depends from claim 19 and therefore defines patentably over Morozov et al. for at least the reasons presented above with reference to claim 19.

In addition, claim 20 further limits claim 19 by requiring that the conjugated analyte be for the kinetically enhanced measurement of molecular interactions in

competitive binding assays. No such combination is taught or suggested by Morozov et al.

In view of the above remarks, favorable reconsideration and allowance are respectfully requested.

Respectfully submitted,

Jay M. Cantor
Reg. No. 19906
(202) 639-7713

8. A sample delivery and sensing unit for directed molecular interaction during surface plasmon resonance analysis comprising:

a surface plasmon resonance layer;

an integrally formed surface plasmon resonance sensor in optic communication with the surface plasmon resonance layer and having, in fixed disposition thereto, a housing transparent to a given frequency of light, a source of the given frequency of light directed onto said surface plasmon resonance layer a phtotodetector array and directed from said plasmon resonance detector to said photoedetector array; and

a flow cell attached to the surface plasmon resonance layer, having a fluid path, an analyte detection chamber disposed along the fluid path and having an interior surface in fluidic communication with the surface plasmon resonance layer and having means for generation of a molecular interaction bias across the chamber.

9. The unit of claim 8 wherein the molecular interaction bias is electrical.

10. The unit of claim 8 wherein the molecular interaction bias is magnetic.

11. A sample delivery and sensing unit for directed molecular interaction during surface plasmon resonance analysis comprising:

an integrally formed surface plasmon resonance sensor having, in fixed functional geometric alignment thereto, a housing transparent to electromagnetic radiation of a given frequency range, a source of electromagnetic radiation having the given frequency range, a photodetector array disposed adjacent the surface of the housing and substantially coplanar with the source, such that radiation from the source reflects off the surface and strikes the photodetector array;

a thin surface plasmon resonance layer in optic communication with an exterior surface of the integrally formed surface plasmon resonance sensor; and

an analyte detection chamber in fluidic communication with the surface plasmon resonance layer having means for generating a molecular interaction bias across the analyte detection chamber to direct bias responsive conjugated molecules to the surface plasmon resonance layer.

12. The unit of claim 11 wherein the molecular interaction bias across the analyte detection chamber is electrical.

13. The unit of claim 11 wherein the molecular interaction bias across the analyte detection chamber is magnetic.

14. A method for kinetically controlled surface plasmon resonance analysis comprising:

providing a surface plasmon resonance sensor having a surface plasmon layer in optical communication with the sensor;

derivatizing the surface plasmon layer;

placing an analyte detection chamber in fluidic communication with the derivatized surface plasmon layer;

providing means in the chamber for generating a molecular interaction bias across the chamber;

providing a conjugate between an analyte and a bias responsive moiety, wherein the analyte is reactive with the derivatized surface plasmon layer and the bias responsive moiety changes the response of the analyte to the molecular interaction bias;

introducing the conjugated analyte into the chamber;

generating the molecular interaction bias within the chamber; and

determining changes in surface plasmon resonance due to association of the conjugated analyte to the derivatized surface plasmon layer.

15. The method of claim 14 wherein the molecular interaction bias is electrical.

16. The method of claim 15 wherein the molecular interaction bias is magnetic.

17. A sample delivery and sensing apparatus for performing the method of claim 15.

18. A sample delivery and sensing apparatus for performing the method of claim 16.

19. The method of claim 14 wherein the conjugated analyte is for the kinetically enhanced measurement of molecular interactions in the groups consisting of: avidin-biotin binding, antibody-antigen binding, antibody-antigen dissociation kinetics, protein binding, protein-nucleic acid binding, specific detection of small molecules, concentration of analytes, measurement of oligonucleotide complements, mixture proportions, receptor-ligand interactions, aptamer interactions, and molecular assembly events.

20. The method of claim 19 wherein the conjugated analyte is for the kinetically enhanced measurement of molecular interactions in competitive binding assays.